

# MD DNR Vertical Water Quality Profiler Project 2018

Metadata also available as - [[Parseable text](#)] - [[XML](#)]

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### *Identification Information:*

#### *Citation:*

##### *Citation Information:*

##### *Originator:*

Maryland Department of Natural Resources, Resource Assessment Service (MD DNR RAS)

*Publication Date:* 20190411

*Title:* MD DNR Vertical Water Quality Profiler Project 2018

*Geospatial Data Presentation Form:* Spatial dataset

#### *Description:*

##### *Abstract:*

Water quality was monitored at a site in Harris Creek, a tributary of the Choptank River and the site of a large-scale oyster restoration project. A vertical profiling system (YSI 6951), equipped with a YSI (6600V2-4) data sonde, was used to sample seven environmental parameters: water temperature, specific conductance, dissolved oxygen concentration, oxygen percent saturation, pH, turbidity, and fluorescence. Salinity and chlorophyll were derived from specific conductance and fluorescence, respectively. Depth below the water surface was also recorded with each set of sonde readings. Profiles were conducted hourly, with measurements recorded at approximate 0.5 meter depth intervals throughout the entire water column. Total depth at this station measured between 2.5-3.0 meters.

##### *Purpose:*

Harris Creek is a tributary of the Choptank River, located on Maryland's Eastern Shore of the Chesapeake Bay. A designated oyster sanctuary, Harris Creek is the site of a large-scale oyster restoration project conducted by the Maryland Department of Natural Resources (MD DNR), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Army Corps of Engineers (USACE). The 2018 MD DNR Vertical Water Quality Profiler Project characterized the vertical and temporal variability of water quality at a single site in Harris Creek. Data from the project will help fisheries managers better understand how water quality affects the settlement of oyster larvae as well as the growth and survival of juvenile oysters.

During the 2018 monitoring season, the MD DNR Shallow Water Monitoring Program deployed two additional continuous monitors at locations upstream and downstream of the vertical profiler. The monitors at stations XFG6431 (upstream) and XFG2810 (downstream) were positioned at a fixed depth 0.3 meters above the creek bottom. Together, data from all three stations are used to characterize the temporal and spatial variability of water quality along the length of Harris Creek.

##### *Supplemental Information:*

Prior to performing each hourly profile, the profiler data sonde collected a surface water reading while resting in a parked position at 1.5 meter depth. In previous years, the profiler data sonde parked at a depth of 1.0 meter. However, in 2018, a parking depth of 1.5 meter was used to try and alleviate the extreme biofouling that occurs at this monitoring site. The hourly surface readings from the profiler sonde are

reported as part of the MD DNR Continuous Water Quality Monitoring Project for 2018. The data collected at the two additional monitoring sites in Harris Creek (stations XFG6431 and XFG2810) are also included in the MD DNR Continuous Water Quality Monitoring Project. Citation information for the 2018 MD DNR Continuous Water Quality Monitoring Project is provided in the Cross Reference portion of this metadata record.

Generally, the data sonde for the profiler was exchanged with a freshly calibrated sonde bi-weekly. When the data sonde was exchanged, water samples were collected for laboratory analysis of chlorophyll  $\alpha$ , phaeophytin, total suspended solids, and alkalinity. At the same time, Secchi disk depth was measured and a HydroLab (series III or IV) water quality sonde was used to collect discrete water temperature, salinity, dissolved oxygen, and pH data. Light attenuation was also measured using a LI-COR instrument. The data collected during field visits can be accessed through the Chesapeake Bay Program CIMS DataHub:

[<<http://www.chesapeakebay.net/data/index.htm>>]. Alkalinity data are available through the Eyes on the Bay web site: [<<http://eyesonthebay.dnr.maryland.gov/contmon/HarrisCreekAlkalinity.cfm>>].

Site visits were conducted following the protocols of the MD DNR Shallow Water Monitoring Program. Detailed descriptions of the field and laboratory procedures can be found in the following documentation:

1) "MDDNR Continuous Water Quality Monitoring Project Metadata" for 2018 can be found using publication type 'Metadata' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website <<http://eyesonthebay.dnr.maryland.gov/eyesonthebay/stories.cfm>>

2) "Quality Assurance Project Plan for the Maryland Department of Natural Resources, Chesapeake Bay Shallow Water Quality Monitoring Program, for the period July 1, 2018 - June 30, 2019", can be found using publication type 'Quality Assurance Project Plan' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website

<[http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM\\_QAPP\\_2018\\_2019\\_Draft\\_v6.pdf](http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM_QAPP_2018_2019_Draft_v6.pdf)>

#### *Time\_Period\_of\_Content:*

##### *Time\_Period\_Information:*

##### *Range\_of\_Dates/Times:*

*Beginning\_Date:* 20180309

*Ending\_Date:* 20190108

*Currentness\_Reference:* Ground condition

#### *Status:*

*Progress:* Complete

*Maintenance\_and\_Update\_Frequency:* As needed

#### *Spatial\_Domain:*

##### *Bounding\_Coordinates:*

*West\_Bounding\_Coordinate:* -76.303383

*East\_Bounding\_Coordinate:* -76.303383

*North\_Bounding\_Coordinate:* 38.743233

*South\_Bounding\_Coordinate:* 38.743233

#### *Keywords:*

##### *Theme:*

##### *Theme\_Keyword\_Thesaurus:*

Global Change Master Directory (GCMD). 2019. GCMD Keywords, Version 8.6. Greenbelt, MD: Earth Science Data and Information System, Earth Science Projects Division, Goddard Space Flight Center (GSFC) National Aeronautics and Space Administration (NASA). [URL (GCMD Keyword Forum Page): <https://wiki.earthdata.nasa.gov/display/gcmdkey>]

##### *Theme\_Keyword:*

Earth Science > Biosphere > Ecosystems > Marine Ecosystems > Estuary

##### *Theme\_Keyword:*

Earth Science > Biosphere > Ecosystems > Marine Ecosystems > Reef > Oyster Reef

*Theme\_Keyword:*

Earth Science > Human Dimensions > Habitat Conversion/Fragmentation > Eutrophication

*Theme\_Keyword:*

Earth Science > Human Dimensions > Habitat Conversion/Fragmentation >  
Reclamation/Revegetation/Restoration

*Theme\_Keyword:*

Earth Science > Biosphere > Ecological Dynamics > Ecosystem Functions > Primary Production

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Surface Water > Surface Water Chemistry

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Surface Water > Surface Water Processes/Measurements  
> Water Depth

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Alkalinity

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Chlorophyll Concentrations

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Conductivity

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Light Transmission

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Gases > Dissolved  
Oxygen

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> pH

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Solids > Suspended  
Solids

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Turbidity

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Water Temperature

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Saline Concentration

*Theme\_Keyword:*

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics  
> Eutrophication

*Place:*

*Place\_Keyword\_Thesaurus:* Producer Defined

*Place\_Keyword:* United States of America

*Place\_Keyword:* United States

*Place\_Keyword:* Maryland

*Place\_Keyword:* Chesapeake Bay

*Place\_Keyword:* Choptank River

*Place\_Keyword:* Harris Creek

*Place\_Keyword:* Talbot County

*Place\_Keyword:* USA

*Place\_Keyword:* MD

*Temporal:**Temporal\_Keyword\_Thesaurus:* Producer Defined*Temporal\_Keyword:* 2018*Access\_Constraints:* None*Use\_Constraints:*

Acknowledgement of the MD Department of Natural Resources, Resource Assessment Service as a data source would be appreciated in products developed from these data.

*Point\_of\_Contact:**Contact\_Information:**Contact\_Person\_Primary:**Contact\_Person:* Mark Trice*Contact\_Organization:*

Maryland Department of Natural Resources, Resource Assessment Service

*Contact\_Position:* Program Chief, Water Quality Informatics*Contact\_Address:**Address\_Type:* Mailing and physical address*Address:* Tawes State Office Building, 580 Taylor Avenue, D-2*City:* Annapolis*State\_or\_Province:* MD*Postal\_Code:* 21401*Contact\_Voice\_Telephone:* 410 260-8630*Contact\_Electronic\_Mail\_Address:*

mark.trice\_nospam\_@maryland.gov[Remove \_nospam\_ for valid email address]

*Browse\_Graphic:**Browse\_Graphic\_File\_Name:*

MD DNR Continuous Monitoring Project 2018 Station Map can be found using publication type 'map' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website

<[http://eyesonthebay.dnr.maryland.gov/contmon/stn\\_map/Cmon\\_stns\\_2018.pdf](http://eyesonthebay.dnr.maryland.gov/contmon/stn_map/Cmon_stns_2018.pdf)>

*Browse\_Graphic\_File\_Description:*

Map title: "Maryland Department of Natural Resources Shallow Water Monitoring: Continuous Monitoring Stations 2018". The vertical profiler is listed as "PRO: Choptank River - Harris Creek Profiler" (Station XFG4618).

*Browse\_Graphic\_File\_Type:* PDF*Data\_Set\_Credit:*

Maryland Department of Natural Resources, Resource Assessment Service staff maintained the profiler and the data sondes, and processed the data. The project was made possible with funding provided by The State of Maryland and the National Oceanic and Atmospheric Administration Chesapeake Bay Program Office.

*Cross\_Reference:**Citation\_Information:**Originator:*

Maryland Department of Natural Resources, Resource Assessment Service

*Publication\_Date:* 20190307*Title:* MD DNR Continuous Water Quality Monitoring Project 2018*Geospatial\_Data\_Presentation\_Form:* Spatial dataset*Online\_Linkage:*

MD DNR Continuous Water Quality Monitoring Project data for 2018, including the hourly records collected at the Harris Creek profiler and the data collected at the upstream and downstream continuous monitoring stations in Harris Creek, are available through the Continuous Monitoring

Data page of the Eyes on the Bay website

<<http://eyesonthebay.dnr.maryland.gov/contmon/ContMon.cfm>>. Access sonde data by following website instructions.

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### *Data\_Quality\_Information:*

#### *Attribute\_Accuracy:*

##### *Attribute\_Accuracy\_Report:*

MD DNR followed specific procedures to ensure that the Vertical Water Quality Profiler Project design was properly implemented and managed with sufficient accuracy, precision, and detection limits. Accuracy (closeness to the true value) of collected data was controlled and assured by the proper use, calibration and maintenance of field equipment for the measurement of physical and chemical parameters. The vertical profiler system consisted of a YSI 6951 pontoon platform fitted with a YSI 6960 Controller Assembly and a YSI 6955 Winch Assembly. A YSI 6600V2-4 monitoring sonde was suspended from the vertical profiler to measure water quality.

The YSI 6600V2-4 sonde was configured with the following probes: 6560(conductivity/temperature); 6561(bulb pH) or 6579(tall pH) or 5091(flat pH); 6136(turbidity); 6150ROX (dissolved oxygen); 6025(fluorescence/chlorophyll). Resolution, range and accuracy specifications for the sonde and probes may be obtained from the manufacturer. [<<https://www.ysi.com/products/multiparameter-sondes>>] Procedures used to control and assure the accuracy of field measurements consisted of equipment maintenance, calibration of field instruments, and verification of calibrations. Details of how data acquired with YSI sondes were quality assured and quality controlled may be found in the process description elements in the Lineage portion of this metadata record.

##### *Logical\_Consistency\_Report:*

The vertical profiler conducted profiles every hour beginning at the top of the hour. Profiles were conducted in a "bottom up" manner, with the first reading for each profile sequence taken at 2m below the surface. As the instrument rose through the water column, additional readings were taken at depths of 1.5m, 1.0m, and 0.5m below the surface. The profiler moved to a new depth about every 2 minutes and a complete profile took approximately 8 minutes to complete.

Although the profiler was programmed to collect readings at 2.0m, 1.5m, 1.0m, and 0.5m, the actual depths for data collection varied slightly due to wave action and water currents displacing the sonde in the water column. Generally, the depths at which readings were taken were within +/- 0.1m of the programmed depth.

##### *Completeness\_Report:*

June 4, 2018 began a period of unreliable performance for the vertical profiler. During the period from June 4, 2018 to July 2, 2018, the profiler repeatedly switched to "standby" mode and stopped conducting profiles. Attempts to restart the profiler remotely were unsuccessful and only intermittent profiles are available during this time. On July 2, 2018, the instrument was rewired to correct a problem with a reel pin on the winch that was rubbing against the sonde cable. However, erratic operation and unreliable data collection continued for several days more. From July 3, 2018 to July 5, 2018, a gap in profile records occurred as profiler operation stopped with the sonde resting on the creek bottom. The profiler was successfully restarted and normal functioning resumed on July 5, 2018.

From September 4, 2018 to September 5, 2018, several profiles were missed as the instrument underwent additional rewiring and maintenance.

Gaps in the profile data record exist during the periods October 12, 2018 to October 24, 2018; October 28, 2018 to October 30, 2018; and December 22, 2018 to January 2, 2019. Missing profiles occurred when the profiler switched to "standby" mode and needed to be restarted. Presumably, the profiler switched into "standby" mode after the sonde struck bottom during a profile sequence. This may happen during extreme low tides or windy conditions.

Additional profiles may appear in the data record on dates when DNR field biologists exchanged sondes at the profiler site. During field visits, biologists often triggered a profile to be performed in order to test that the instrument was operating properly.

All other sonde attribute values that are missing from the dataset were censored during the data quality control process. Analysts examined the data and masked values that were determined to be unreliable.

Profiler data collection ended on January 8, 2019 when the instrument was removed from Harris Creek to prevent damage due to ice formation.

##### *Lineage:*

*Process\_Step:**Process\_Description:*

SONDE CALIBRATION and POST-CALIBRATION: The Yellow Springs Instrument (YSI) 6600V2-4 data sondes were maintained and calibrated before and after each deployment in accordance with YSI recommendations: [<http://www.ysi.com>]. Ecowatch™ software (a YSI product) was used to calibrate the instruments.

FIELD MEASUREMENTS: The vertical profiling system consisted of the YSI 6951 pontoon platform fitted with the YSI 6960 Controller assembly and the YSI 6955 Winch assembly. A YSI 6600V2-4 data sonde was suspended from the profiler system to monitor water quality. The monitoring sonde at the profiler site recorded seven water quality parameters at each 0.5 meter depth of the vertical profile. Profiles were conducted every hour, with new depth and parameter readings recorded approximately every 2 minutes. Along with depth, the seven water quality parameters measured were: water temperature, specific conductance (used to calculate salinity), dissolved oxygen concentration, oxygen percent saturation, turbidity (NTU), fluorescence (used to estimate chlorophyll), and pH.

The YSI 6600V2-4 sonde was configured with the following probes:

6560(conductivity/temperature); 6561(bulb pH); 6136(turbidity); 6150ROX(dissolved oxygen); 6025(fluorescence/chlorophyll). The sonde logged data onto a Campbell Scientific CR1000 datalogger, and the data were stored on the CR1000 until retrieval. The station was equipped with a cellular telemetry unit, which allowed data to be accessed remotely and transmitted to a server computer at DNR. Data were retrieved every hour and made available publicly on DNR's web site [<http://www.eyesonthebay.net>].

SONDE DATA CHECKS: The monitoring sonde was retrieved, calibrated, and replaced once during March 2018, April 2018, July 2018, September 2018, and November 2018; and bi-weekly during May 2018, June 2018, August 2018, and October 2018. At each deployment, sondes were replaced with clean, recalibrated units. Dates of sonde replacement in 2018 were: March 29 (initial deployment), April 24, May 7, May 23, June 5, June 19, July 16, August 9, August 22, September 27, October 9, October 30, and November 26. On September 4, 2018, the sonde was cleaned in the field and redeployed at the site. The sonde, along with the entire vertical profiler unit, was removed and not replaced on January 8, 2019.

In the field, before an instrument was replaced, field biologists allowed both the new (freshly calibrated) sonde and the old (deployed) sonde to log simultaneous readings side by side at the same depth. In addition, data were recorded from a discrete instrument - usually a HydroLab sonde. This three-way comparison assured that the "new" and "old" sondes were both reading each parameter within a certain tolerance. The HydroLab reading was used as a "double-check", and since it was a discrete reading, it allowed biologists to watch the display and note whether the parameters were fluctuating or stable.

Data were evaluated using both three-way in-situ comparison results and data from sonde calibrations. The comparison tolerances were as follows for both pre- and post-calibration and in-situ comparisons: Temperature (degrees C) +/- 0.2; Specific Conductance (uS/cm) +/- 5%; Dissolved Oxygen (mg/l) +/- 0.5 mg/l; pH +/- 0.2; Turbidity (NTU) +/- 5% or 5.0 NTU (whichever is greater); Chlorophyll (ug/l) +/- 5% or 5.0 ug/l (whichever is greater). Excessive drift between pre- and post- calibration values of sonde probes, variance from in-situ measurements or probe failures caused data to be flagged. When post-calibration drift exceeded the limits stated above in both the post-calibration and the in-situ comparables, the questionable data were masked within the data set with an error code.

*Process\_Date:* Unknown

*Process\_Contact:*

*Contact\_Information:**Contact\_Person\_Primary:*

*Contact\_Person:* Kristen Heyer

*Contact\_Organization:*

Maryland Department of Natural Resources, Resource Assessment Service

*Contact\_Position:* Program Manager, Monitoring Field Office

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* 1919 Lincoln Drive

*City:* Annapolis

*State\_or\_Province:* Maryland

*Postal\_Code:* 21401

*Country:* USA

*Contact\_Voice\_Telephone:* 410 263-3369

*Contact\_Electronic\_Mail\_Address:*

Kristen.Heyer\_nospam\_@maryland.gov[Remove \_nospam\_ for valid email address]

## *Process\_Step:*

### *Process\_Description:*

Data downloaded from the sonde were subjected to quality assurance/quality control checks to ensure that values outside the range of possibility were identified in the published dataset.

Loggernet™ software (a Campbell Scientific product [<http://www.campbellsci.com>]) was used to download the data collected by the profiler. Using SAS statistical software, the "raw" .txt file of sonde data was queried to select dates that corresponded with each sonde deployment. Also, data columns were rearranged to achieve a format expected by an Excel® macro used for post-processing. The resulting data file was saved as a .csv file.

Each .csv file of sonde data was then post-processed using the aforementioned Excel® macro. The file was opened and renamed. Rows of data acquired before and after deployment were deleted. Records (if any) were also deleted if instrument error codes indicated invalid data. The macro rearranged columns and inserted error-tracking columns and headings. Macro statements flagged negative values, missing values and highlighted values outside each parameter's normal range. The macro also returned a report summarizing range exceedances. Event and instrument information was appended to each record.

Flagged values were evaluated. Common anomalies included spikes in fluorescence and turbidity, dips in specific conductance, and high dissolved oxygen readings. Instrument post-calibration results, in-situ comparisons with HydroLab readings, LI-COR readings, historical data from nearby locations, and survey crew remarks were used to determine whether sensor values were acceptable. In cases where data were determined to be unreliable, the reason(s) were documented with error codes and comments. Unreliable data were masked. No data were discarded. Only data considered reliable were published in reports.

MD DNR scientists reviewed profiler monitoring data weekly. If a problem was identified, a field biologist was dispatched to address the issue as soon as possible.

**VERIFICATION AND DATA MANAGEMENT** At the end of the monitoring season, DNR data analysts and field biologists conducted additional data QA/QC procedures. All of the data were plotted and outliers and anomalous values were thoroughly researched. Staff compared unusual values to historic values from the site and values from nearby sites in the Bay. Weather events were considered, event logs were reviewed and field staff were consulted regarding possible legitimate causes for the values. In cases where values were not considered legitimate, error codes were assigned. All data were retained in the archive data set. After field staff and the Quality Assurance Officer reviewed error flags, the values were masked within the published dataset.

*Process\_Date:* Unknown

*Process\_Contact:*

### *Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Mark Trice

*Contact\_Organization:*

Maryland Department of Natural Resources, Resource Assessment Service

*Contact\_Position:* Program Chief, Water Quality Informatics

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* Tawes State Office Building, 580 Taylor Avenue, D2  
*City:* Annapolis  
*State\_or\_Province:* Maryland  
*Postal\_Code:* 21401  
*Country:* USA

*Contact\_Voice\_Telephone:* 410 260-8630

*Contact\_Electronic\_Mail\_Address:*

mark.trice\_nospam\_@maryland.gov[Remove \_nospam\_ for valid email address]

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*Spatial\_Data\_Organization\_Information:*

*Indirect\_Spatial\_Reference:* Chesapeake Bay, Maryland, USA

*Direct\_Spatial\_Reference\_Method:* Point

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*Spatial\_Reference\_Information:*

*Horizontal\_Coordinate\_System\_Definition:*

*Geographic:*

*Latitude\_Resolution:* 0.0001

*Longitude\_Resolution:* 0.0001

*Geographic\_Coordinate\_Units:* Decimal degrees

*Geodetic\_Model:*

*Horizontal\_Datum\_Name:* North American Datum of 1983

*Ellipsoid\_Name:* Geodetic Reference System 80

*Semi-major\_Axis:* 6378137

*Denominator\_of\_Flattening\_Ratio:* 298.257

*Vertical\_Coordinate\_System\_Definition:*

*Depth\_System\_Definition:*

*Depth\_Datum\_Name:* No correction

*Depth\_Resolution:* 0.001

*Depth\_Distance\_Units:* meters

*Depth-Encoding\_Method:* Attribute values

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*Entity\_and\_Attribute\_Information:*

*Overview\_Description:*

*Entity\_and\_Attribute\_Overview:*

This metadata record is a description of a vertical profiler water quality monitoring project in Harris Creek, a tidal tributary of the Chesapeake Bay. Water quality data were collected at 0.5 meter depth intervals at a single station (XFG4618) during 2018.

The data are comprised of the attributes: SAMPLE\_DATE: date (month/day/year) SAMPLE\_TIME: Eastern Standard Time, 24 hour format (hour:minutes) STATION: station name (text) SONDE: sonde identifier (text) TOTAL\_DEPTH: depth below water surface (meters) BATT: battery charge (Volts) WTEMP: water temperature (degrees Celsius) SPCOND: specific conductance (micro Siemens per centimeter) SALINITY: salinity (parts per thousand) DO\_SAT: dissolved oxygen percent saturation (percent) DO: dissolved oxygen (milligrams per liter) PH: pH (pH units) TURB\_NTU: turbidity (Nephelometric Turbidity Units) FLUOR: fluorescence (Relative Fluorescence Units) TCHL\_PRE\_CAL: chlorophyll (micrograms per liter) CHLA: No data - all data values blank COMMENTS: comments (text)

*Entity\_and\_Attribute\_Detail\_Citation:*

The Vertical Water Quality Profiler Project was conducted in a manner consistent with the procedures established for the MD DNR Shallow Water Monitoring Program. Data users who desire very detailed information about data-definition, sampling-procedures, and data-processing are encouraged to refer to the document listed below.

"Quality Assurance Project Plan for the Maryland Department of Natural Resources, Chesapeake Bay Shallow Water Quality Monitoring Program, for the period July 1, 2018 - June 30, 2019", can be found using publication type 'Quality Assurance Project Plan' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website  
<[http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM\\_QAPP\\_2018\\_2019\\_Draft\\_v6.pdf](http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM_QAPP_2018_2019_Draft_v6.pdf)>.

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#### *Distribution\_Information:*

##### *Distributor:*

##### *Contact\_Information:*

##### *Contact\_Person\_Primary:*

*Contact\_Person:* Mark Trice

*Contact\_Organization:*

Maryland Department of Natural Resources, Resource Assessment Service

*Contact\_Position:* Program Chief, Water Quality Informatics

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* Tawes State Office Building, 580 Taylor Avenue, D-2

*City:* Annapolis

*State\_or\_Province:* Maryland

*Postal\_Code:* 21401

*Country:* USA

*Contact\_Voice\_Telephone:* 410 260-8630

*Contact\_Electronic\_Mail\_Address:*

mark.trice\_nospam\_@maryland.gov[Remove \_nospam\_ for valid email address]

*Resource\_Description:* Downloadable data

##### *Distribution\_Liability:*

None of the Maryland Department of Natural Resources (MD DNR) partners or any of their employees, contractors, or subcontractors makes any warranty, expressed or implied, nor assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or data contained within the web site. Reference to any specific commercial products, processes, or services or the use of any trade, firm, or corporation name is for the information and convenience of the public and does not constitute endorsement, recommendation or favoring by MD DNR partners.

##### *Standard\_Order\_Process:*

##### *Digital\_Form:*

##### *Digital\_Transfer\_Information:*

*Format\_Name:* ASCII file, formatted for text attributes, declared format

*Format\_Information\_Content:* Vertical profiler monitoring sonde data

*File-Decompression\_Technique:* No compression applied

##### *Digital\_Transfer\_Option:*

##### *Online\_Option:*

##### *Computer\_Contact\_Information:*

##### *Network\_Address:*

*Network\_Resource\_Name:*[<<http://eyesonthebay.dnr.maryland.gov/contmon/VerticalProfilerData.cfm>>]*Access\_Instructions:*

Vertical profiler data (sonde data) are available through the vertical profiler data download page of the MD DNR "Eyes on the Bay" website. Access sonde data through the link provided under "Network Resource Name" in this metadata record. A file containing one week of data is approximately 110 kb in size with download times dependent upon computer connection speed.

The complete record of vertical profiler data for 2018, including masked data values, error codes, and comments, can also be obtained from the MD DNR Resource Assessment Service. Contact information is provided in the "Distributor" portion of this metadata record.

*Fees:* None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20190418

*Metadata\_Contact:*

*Contact\_Information:**Contact\_Person\_Primary:*

*Contact\_Person:* Diana Domotor

*Contact\_Organization:*

Maryland Department of Natural Resources, Resource Assessment Service

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* Tawes State Office Building, 580 Taylor Avenue, D2

*City:* Annapolis

*State\_or\_Province:* Maryland

*Postal\_Code:* 21401

*Country:* USA

*Contact\_Voice\_Telephone:* (410) 260-8630

*Contact\_Electronic\_Mail\_Address:*

diana.domotor\_nospam\_@maryland.gov[Remove \_nospam\_ for valid email address]

*Metadata\_Standard\_Name:* Content Standards for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001-1998

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Generated by [mp](#) version 2.9.32 on Tue May 21 09:46:30 2019